Laser speckle contrast imaging: age-related changes in microvascular blood flow and correlation with pulse-wave velocity in healthy subjects

Titre	Laser speckle contrast imaging: age-related changes in microvascular blood flow and correlation with pulse-wave velocity in healthy subjects
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Résumé en anglais	In the cardiovascular system, the macrocirculation and microcirculation—two subsystems—can be affected by aging. Laser speckle contrast imaging (LSCI) is an emerging noninvasive optical technique that allows the monitoring of microvascular function and can help, using specific data processing, to understand the relationship between the subsystems. Using LSCI, the goals of this study are: (i) to assess the aging effect over microvascular parameters (perfusion and moving blood cells velocity, MBCV) and macrocirculation parameters (pulse-wave velocity, PWV) and (ii) to study the relationship between these parameters. In 16 healthy subjects (20 to 62 years old), perfusion and MBCV computed from LSCI are studied in three physiological states: rest, vascular occlusion, and post-occlusive reactive hyperaemia (PORH). MBCV is computed from a model of velocity distribution. During PORH, the experimental results show a relationship between perfusion and age (R2=0.67) and between MBCV and age (R2=0.72), as well as between PWV and age at rest (R2=0.91). A relationship is also found between perfusion and MBCV for all physiological states (R2=0.98). Relationships between microcirculation and macrocirculation (perfusion-PWV or MBCV-PWV) are found only during PORH with R2=0.76 and R2=0.77, respectively. This approach may prove useful for investigating dysregulation in blood flow.
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